memmert
Experts in Thermostatics

Constant climate chambers **HPP**
Humidity chambers **HCP**

Constant climate chambers HPP:
Tailor-made for ongoing stability testing in pharmaceutics

Humidity Chambers HCP: 40 ramps for combined temperature and humidity setpoints, programmable directly on the chamber

Active humidity control in HPP and HCP:
low risk of contamination, short recovery times

Energy-saving

Wide-ranging convenience

Humidity without condensation

>>>> www.memmert.com

A perfect simulation of reality

Safe and reliable! Precisely reproducible material tests in line with standards are crucial in research and development, as well as in industry, for a consistently high product quality – and in many cases also for the health and safety of people. The constant climate chambers HPP and the humidity chambers HCP unite the best from more than 60 years of knowledge and experience at the Memmert company: unparalleled precision, absolute reliability over many years, an elegance of form and standard features for logging and documentation that leaves nothing to be desired.

Corrosion-resistant and hygienic stainless steel

We declare our uncompromising commitment to quality and aesthetics. Structured stainless steel is the unique defining feature of Memmert appliances. Functional design in its most elegant form: scratch-resistant, robust and durable. Wherever our units are used, the superiority of this high-quality material compared to coated sheet steel can be seen, which can corrode when in constant use.

Active humidification and dehumidification

Both for tests in a constant climate and simulated environmental conditions, a stable and precisely adjustable relative humidity is of crucial importance. The advantages for you: low risk of contamination and short recovery times after the door has been opened. In addition, set temperatures and humidity values can be maintained exactly, even in areas with a high ambient temperature and extremely high or low humidity.

Inner chamber made exclusively of high-grade fully recyclable stainless steel 1.4301 (ASTM 304).

Convenience: made for you!

Convenient to operate:

- Clear, easy-to-clean underglass function display
- Memmert's unique feature: the patented push-turn control for intuitive selection from the entire menu
- Fully insulated stainless steel door and internal glass door for observing the chamber load without affecting the temperature

Reliable and precise for a small eternity

Precision: for controlled procedures

Technical features for fault-free processes:

- User-friendly programming of up to 40 temperature ramps directly on the appliance; practically unlimited number of ramps using standard "Celsius" software
- Internal ventilation for optimal temperature distribution
- Multi-functional fuzzy-supported control for exact setting and maintenance of setpoint temperature
- Controller calibration at three freely selected temperatures directly on the appliance
- Option: up to three additional and freely positionable Pt100 sensors for indication on the display and recording in the log memory

Documentation: For controlled quality

The basic outfit for professional quality assurance:

- Standard "Celsius" software with more functionality for programming and logging, also optional FDA-conforming software
- Driver for communication with LabVIEW
- Internal ring memory for uninterrupted long-term documentation (approx. 3 months) protected against manipulation
- MEMoryCard XL for programming up to 40 temperature ramps and documenting the temperature profiles
- USB interface (option Ethernet) for programming and storage as well as parallel printer interface

Security: Of course!

Yet more functions for zero error:

- Integral auto-diagnostic system with visual and audible fault indication
- Multiple temperature monitoring
- Two high-grade Pt100 sensors Class A in 4-wire circuit, mutually monitoring
- Audible and visible signal on over- and undertemperature
- Option: volt-free contacts on "combination error" and "setpoint reached"
- Protection against unauthorised operation: through optional personal User-ID-Card
- Option: door with lock

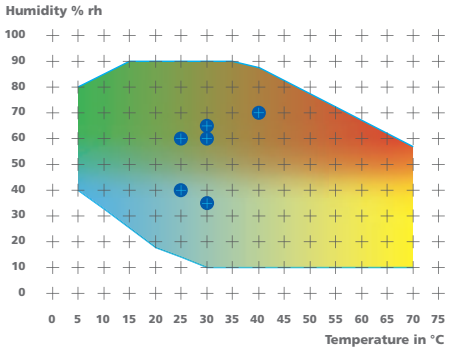
Best climate for quality, environment and your budget!

They just keep on running and running, the energy-saving constant climate chambers for environmental simulations and long-term material tests. The high precision temperature control from 5 °C to 70 °C, as well as active humidification and dehumidification from 10% to 90% rh in the HPP constant climate chambers, are optimally tuned to the requirements for ongoing stability testing in accordance with ICH*.

With almost no vibration and very little noise, the specially adapted Peltier technology heats and cools seamlessly in a single system. Thus, the innovative constant climate chamber not only contributes to climate protection, but also manages to reduce operating costs by up to 90% compared to compressor technology.

2 sizes: 108 – 749 litre chamber volume

Temperature-humidity working range

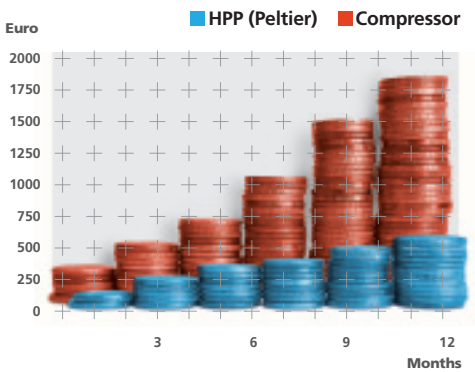


● Temperature and humidity test points defined in the guideline

Climate protection with a conservation effect

This premium class energy saver reduces strain on the climate, at the same time notably reducing test costs. The main part of ongoing stability testing is performed at temperatures between 20 °C and 30 °C – that is, close to the ambient temperature. The impressive economy of Peltier technology can be seen here, since only small amounts of energy are required to raise or lower the temperature slightly, in comparison with compressor technology.

Energy cost comparison Peltier vs. compressor technology



Energy cost comparison HPP (Peltier technology) with conventional unit (compressor cooling) during a stability test acc. to ICH* (25 °C, 60% rh) – based on competitors' specifications

*International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use

Timer module

1 Time indication (here real time)
2 Text messages

Temperature module

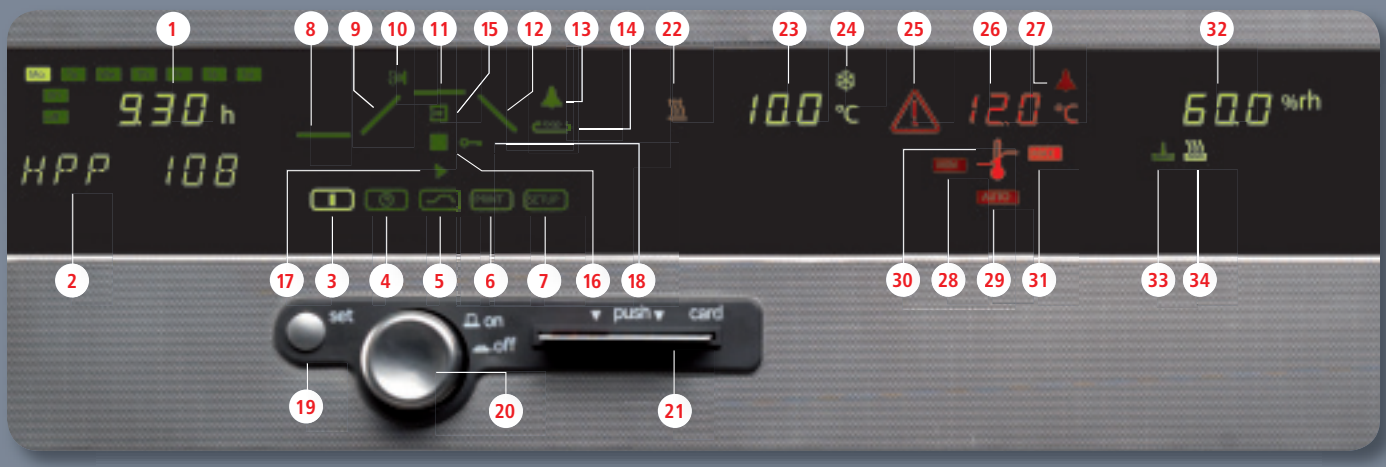
22 Heating
23 Setpoint/actual temperature
24 Cooling (active)

- Temperature adjustment: +5 °C – +70 °C
- Variation (time): ± 0.1 °C max. Uniformity (spatial): ± 0.4 °C at 10 °C

Monitor module

25 Visual alarm
26 Alarm limit
27 Sounder on alarm
28 LOW alarm limit
29 Automatic alarm limit (ASF)
30 Temperature limiter
31 HIGH alarm limit

Acoustic and visual alarm on temperature and humidity out of limit and on other errors



Operating mode

3 Normal operation (active)
4 Weekly timer*
5 Ramp timer
6 Printer
7 Configuration
8 Wait (at programme start)
Hold (during programme)
9 Heating ramp
10 Setpoint wait – programme continues when setpoint is reached
11 Hold ramp
12 Cooling ramp
13 Sounder at ramp timer end
14 Repeat function
15 Edit (ramp timer)
16 Stop (ramp timer)
17 Start (ramp timer)
18 Data manipulation prevented through optional User-ID-Card
19 SET key
20 Push/turn control
21 Chip card reader for MEMoryCard and optional User-ID-Card

* Weekly timer, programmable with one ON and OFF time per weekday; additional group function (e.g. Mo – Fr)

Humidity module

32 Setpoint/actual humidity
33 Water level in storage tank
34 Steam generation

- Humidity range 10 – 90 % rh
- Variation (time) ± 1.5 % rh max.

Humid atmosphere without condensation

The applications for the humidity chamber HCP range from building physics, via corrosion tests, down to biological research. With up to 40 ramps for temperature and humidity, active humidity control from 20 % to 95 % rh, and accurate temperature control up to 90 °C, the extremely reliable and robust humidity chamber creates inside it a controlled, physiologically ideal environment for simulating real conditions. Without addition of moisture the temperature inside the HCP can be regulated up to 160 °C.

3 sizes: 108 – 153 – 246 litre chamber volume

Flexibility: 40 ramps, programmable on the actual chamber

Essential for accurate simulation of environmental conditions in research: the user-friendly ramp programming facility. Different temperature and humidity setpoints can be combined on up to 40 time ramps, but with the standard "Celsius" software, on the other hand, there is no limit to the combinations.

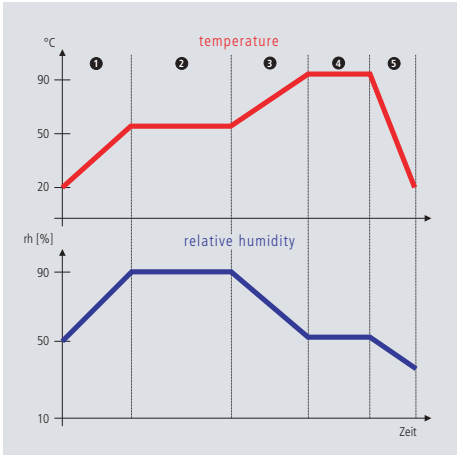
Uniformity inside the chamber

Chamber heating from all six sides is an essential factor for avoiding the formation of condensate inside the chamber. An aluminium heat-conducting jacket helps to ensure optimal temperature distribution and in addition serves as heat store in case of a temporary supply outage.

The turbulence-free chamber ventilation provides a uniformly homogeneous atmosphere.

Bacteria-free through sterilisation function – desinfection is not sufficient!

Hygiene is fundamental, especially in high-sensitivity applications with organic materials. For that reason the entire chamber, including the ventilation system and all sensors, can be sterilised at 160 °C in a 4-hour programme. For safety reasons this function can only be operated by means of the Memmert STERICard in order to prevent unintentional activation.



Timer module

1 Time indication (real-time)
2 Text messages

Temperature module

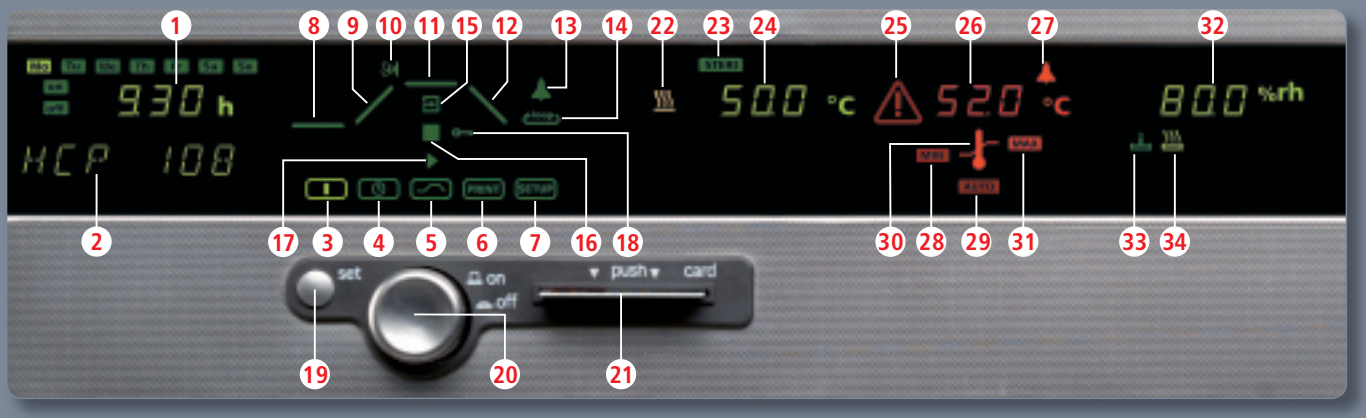
22 Heating
23 Sterilisation operation
24 Setpoint/actual temperature

- Temperature adjustment without humidity: 20 °C to 160 °C (control range from 8 °C above ambient temperature up to 160 °C)
- Temperature adjustment with humidity: 20 °C to 90 °C (control range from 8 °C above ambient temperature up to 90 °C)
- Variation (time): ±0.1 °C max. Uniformity (spatial) ±0.3 °C max. at 50 °C

Monitor module

25 Visual alarm
26 Alarm limit (temperature for heating cut-off)
27 Sounder on alarm
28 LOW alarm limit
29 Automatic alarm limit (ASF)
30 Temperature limiter
31 HIGH alarm limit

Audible and visual alarm on temperature and humidity out of limit, on door open longer than 2 minutes, and on other errors



Operating mode

3 Normal operation (active)
4 Weekly timer*
5 Ramp timer (relative-time programme)
6 Printer
7 Configuration
8 Wait (at programme start)
Hold (during programme)
9 Heating ramp
10 SP.WT – programme continues when setpoint is reached
11 Hold ramp
12 Cooling ramp
13 Sounder at ramp timer end
14 Repeat function
15 Edit (ramp timer)
16 Stop (ramp timer)
17 Start (ramp timer)
18 Data manipulation prevented through optional User-ID-Card
19 SET key
20 Push/turn control
21 Chip card reader for STERICard and optional User-ID-Card

* Weekly timer, programmable with one ON and OFF time per weekday; additional group function (e.g. Mo – Fr)

Humidity module

32 Setpoint/actual humidity
33 Water level in storage tank
34 Steam generation

- Rh concentration selection: 20 – 95% rh
- Variation (time): ± 1% rh max.

Technical data, models and accessories for constant climate chambers HPP (Humidity Peltier-operated Perfect)

Interfaces:

USB

printer interface

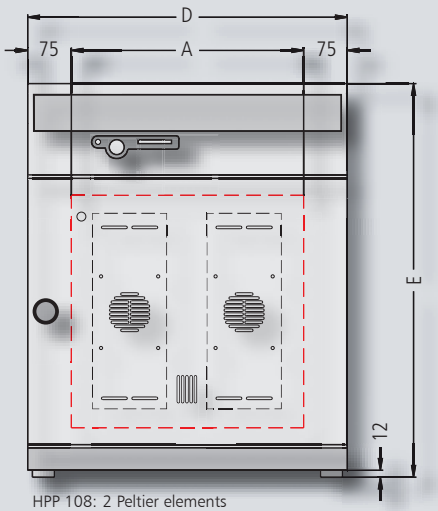
Option:

Ethernet

LAN

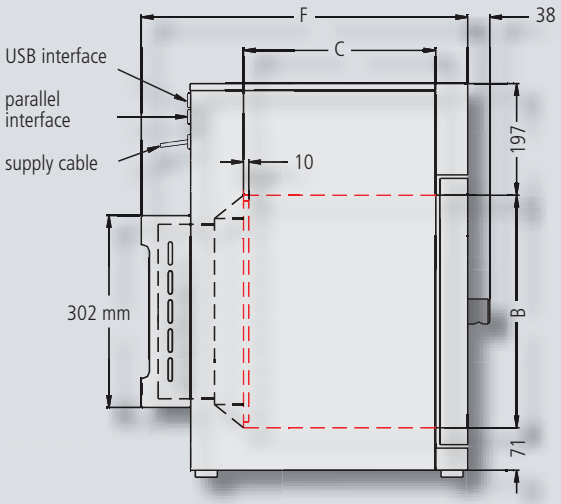
CE

Dimensions of constant climate chambers HPP (see table below)



HPP 108: 2 Peltier elements in the rear

HPP 749: 6 Peltier elements in the rear



Model sizes			HPP	108	749[1]
Stainless steel interior mat. 1.4301 (ASTM 304), deep-drawn	Volume		approx. l	108	749
	Width (see sketches above)	(A)	mm	560	1040
	Height (see sketches above)	(B)	mm	480	1200
	Depth (see sketches above)	(C)	mm	400	600
	Provision for grids or shelves		number	5	14
Textured stainless steel exterior (rear zinc-plated steel)	Width	(D)	mm	710	1190
	Height (size 749 with castors)	(E)	mm	760	1620
	Depth (without door handle, depth of handle 38 mm)	(F)	mm	620	825
	Extra internal glass door			□	□
Temperature	Electronic microprocessor temperature controller with Pt100 and auto-diagnostic system			□	□
	Temperature sensors Pt100 Class A in 4-wire circuit for uninterrupted operation on failure of one Pt100 with warning indication			double	double
	Temperature range		°C	from +5 up to +70	from +5 up to +70
	Temperature variation in time (to DIN 12 880: 2007-05)		°C	≤ ± 0.1	≤ ± 0.15
	Temperature uniformity in chamber at 10 °C and 37 °C (to DIN 12 880: 2007-05)		°C	≤ ± 0.4	≤ ± 0.5
Humidity	Capacitive humidity sensor			□	□
	Active microprocessor control for humidifying and dehumidifying (10 – 90% rh), incl. digital indication and auto-diagnostic system ensures even more rapid reaching of set humidity and very short recovery times while avoiding condensate formation; humidity supply with distilled water (from an external tank) by a self-priming pump; integral bacteria block by generating hotsteam			□	□
Monitor	Microprocessor temperature monitor (protection class 3.3) acting as over- and undertemperature monitor, with Pt100 incorporating fault diagnostics with visual and acoustic alarm			□	□
	Temperature monitoring band automatically linked to the setpoint (ASF)			□	□
	Relay for reliable heating cut-off in case of fault			□	□
	Acoustic alarm: Over- and undertemperature; over-/underhumidity; empty water tank			□	□
Timer functions	Real-time/weekly programmer with group function (e.g. Monday-Friday), programme operation with up to 40 ramps for temperature and humidity (MEMoryCard XL)			□	□
Documentation	Internal log memory 1024 kB as ring memory for all setpoints and actual values of temperature and humidity, errors, settings with real-time and date; capacity approx. 3 months at 1 min. intervals			□	□
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)			□	□
	"Celsius"[2] software for control and documentation of temperature and relative humidity			□	□
Setup	Calibration (no separate PC required), temperature: 3-point calibration on controller, humidity: 2-point calibration at 20% and 90%			□	□
	Setting of language for dialogue and display D / UK / E / F / I			□	□

Subject to technical modifications
All performance data are typical average values for standard appliances

1) Two-leaf door
2) MEMMERT "Celsius" software has been tested for Windows 7, Vista and XP

□ Standard model, basic specification

Model sizes		HPP	108	749
Further data	Electrical load (during heating and cooling)	approx. W	350	1050
	Electrical supply 230 V[1] (± 10%), 50/60 Hz	V	230	230
	Net weight	approx. kg	66	218
	Gross weight	approx. kg	70	278
Standard accessories	Stainless steel grids (shelves to order)	number	2 ☐	2 ☐
	Grid or shelf width	approx. mm	556	1036
	Grid or shelf depth	approx. mm	361	530
	Works calibration certificate at 10 °C and 37 °C at 60% rh (test point chamber centre)		☐	☐
Standard version	Constant climate chamber HPP		HPP 108	HPP 749
Options	Locking door (security lock)		B6	B6
	Perforated stainless steel shelf		E0(x)	E0(x)
	Stainless steel tray (non-perforated) 15 mm rim (may affect the temperature distribution)		E2(x)	E2(x)
	Stainless steel grid (standard version)		E3(x)	E3(x)
	Moisture-tight entry port[2] for introducing connections at the side, can be closed from inside by silicone stopper, (standard position centre/centre or centre top, 23 mm clear diameter)	left centre/centre left centre top right centre/centre right centre top	F0 F1 F2 F3	F0 F1 F2 F3
	Stacking version for 2 units of equal size (bottom unit modification)		G3	G3
	Temperature profile write/read unit for programming via PC, for writing to and reading from the chip card, up to 40 ramps		V3	V3
	Additional chip card, blank, formatted (32 kB MEMoryCard XL for a maximum of 40 ramps)		V4	V4
	Oven-linked authorisation card (User-ID-Card) prevents undesired manipulation by unauthorised third parties. When reordering please specify serial number		V1	V1
	Computer interface RS485 (for networking a maximum of 16 ovens) instead of USB interface		V2	V2
	RS232 interface instead of USB		W6	W6
	Interface Ethernet instead of USB inclusive software "Celsius Ethernet-Edition"		W4	W4
	Parallel/USB converter cable with integrated power supply unit to connect HP printers with USB interface to MEMMERT units		W1	W1
	Documentation package consisting of parallel USB converter cable including PCL3-compatible HP colour inkjet printer with USB interface (HP Deskjet 6980 or successor) for direct connection of printer to Memmert unit		W2	W2
	USB connection cable for computer interface		W7	W7
	Flexible Pt100[2] for positioning in chamber or in load with socket, 4-pin, according to NAMUR NE 28, for external temperature recording (load temperature)		H4	H4
	Potential-free contact (24 V/2 A) with socket, according to NAMUR NE 28 for external monitoring (indicates when setpoint is reached)		H5	H5
	Ditto, according to NAMUR NE 28 for combination error message (e.g. supply failure, sensor fault, fuse)		H6	H6
	Ditto, triple, for signal generation, controlled by programme segment (using PC) for a total of 3 freely selected functions to be activated (e.g. acoustic and visual signals, exhaust motors, fans, stirrers etc.)		H7	H7
	Additional Pt100 temperature sensor[2], positioned flexibly in chamber or load, for local temperature measurement (up to 3 additional sensors are possible). The measured temperature can, if required, be indicated on the multifunction display, recorded in the integral ring store, and can be documented via the „Celsius"[3] software or on an attached printer. During programme operation the additional temperatures of the flexible sensors can, if required, also be employed for the function „setpoint-dependent start of a hold ramp" SPWT (setpoint wait). The subsequent ramp starts only when all the installed sensors have reached the set temperature of the next ramp.		H8(x)	H8(x)
	Works calibration certificate for one temperature and humidity according to customer specification		Z4	Z4
	IQ check list with works test data for chamber as support for validation by customer		Q1	Q1
	OQ check list with works test data for one[4] free-selectable humidity and temperature value incl. temperature distribution survey for 27 measuring points to DIN 12 880: 2007-05 as support for validation by customer		Q2	Q2
	Software conforming to FDA "Celsius FDA Edition"[5] for up to 16 units. Meets the requirements for the use of electronically stored data sets and electronic signatures as laid down in Regulation 21 CFR Part 11 of the US Food and Drug Administration (FDA) • storage of setpoint profiles and documentation data protected against manipulation • user identification with password protection • control of access authorisation of individual users through the administrator • traceability through protected audit trail file • protection against and registration of unauthorised access and manipulation attempts • unique assignment of documentation data through linkage with serial number • use of optional User-ID-Card is recorded in the documentation data		Q3	Q3
	Integration of additional units (up to max.16 units) into an already existent FDA-software licence[5]		Q4	Q4
	Guarantee extension by 1 year		Q5	Q5

Subject to technical modifications
All performance data are typical average values for standard appliances

1) Option 115 V, 50/60 Hz
2) Special equipment requires 20% payment in advance of apparatus price
3) MEMMERT "Celsius" software has been tested for Windows 7, Vista and XP
4) Further temperature distribution surveys as option
5) Requires Windows 2000 Professional or XP Professional
☐ Standard model, basic specification
(x) Please specify quantity required after order number

Technical data, models and accessories for Humidity Chamber HCP (Humidity Chambers Perfect)

Interfaces:

USB

printer interface

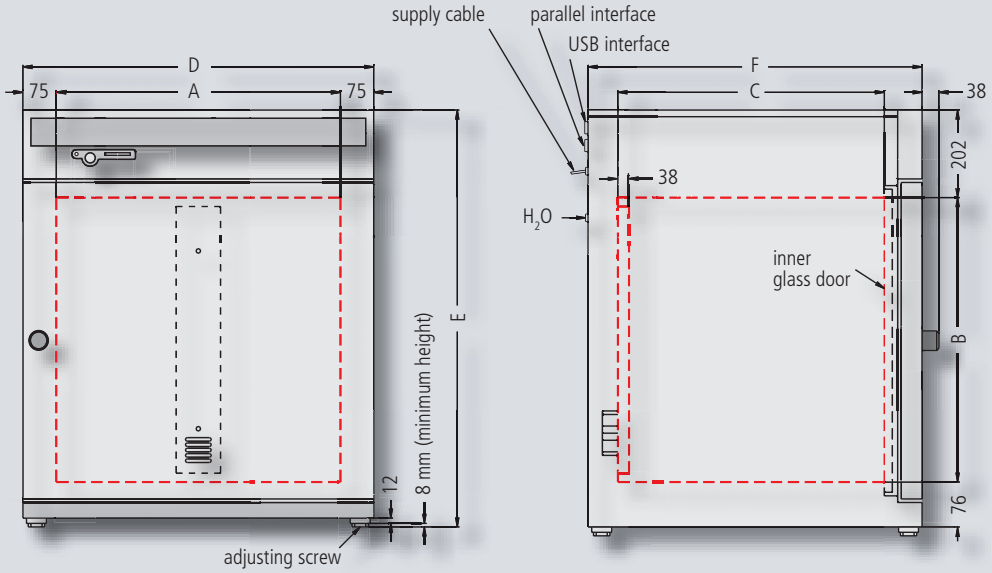
Option:

Ethernet

LAN

CE

Dimensions of constant climate chambers HCP (see table below)



Model sizes			HCP	108	153	246
Stainless steel interior mat. 1.4301 (ASTM 304), deep-drawn	Volume		approx. l	108	153	246
	Width / Height / Depth[1]	(A) / (B) / (C)	mm	560 / 480 / 400	480 / 640 / 500	640 / 640 / 600
	Provision for grids or shelves		number	5	7	7
Textured stainless steel exterior (rear zinc-plated steel)	Width / Height[2] / Depth[3]	(D) / (E) / (F)	mm	710 / 778 / 550	630 / 938 / 650	790 / 938 / 750
	Fully insulated, heated stainless steel door			□	□	□
	Extra internal glass door			□	□	□
Ventilation	Uniform atmosphere and temperature distribution through enclosed non-turbulent ventilation system, fully covered by the sterilisation process			□	□	□
Temperature	Electronic microprocessor temperature controller with Pt100 and auto-diagnostic system			□	□	□
	Temperature sensors Pt100 Class A in 4-wire circuit for uninterrupted operation on failure of one Pt100 with warning indication			double	double	double
	Temperature range with humidity control: Temperature range without humidity control: (during sterilisation the temperature is fixed at 160 °C – set value)		°C °C	from 20[4] up to 90 from 20[4] up to 160	from 20[4] up to 90 from 20[4] up to 160	from 20[4] up to 90 from 20[4] up to 160
	Temperature fluctuations with time (to DIN 12 880: 2007-05)		°C	≤ ± 0.1	≤ ± 0.1	≤ ± 0.1
	Temperature variation in chamber at 50 °C (to DIN 12 880: 2007-05)		°C	≤ ± 0.3	≤ ± 0.3	≤ ± 0.3
Sterilisation	STERICard for automatic chamber sterilisation cycle 4 h at 160 °C (not for sterilising the load!)			□	□	□
Humidity	Capacitive humidity sensor (sterilisable)			□	□	□
	Active microprocessor control for humidifying and dehumidifying (20 – 95 % rh), incl. digital indication and auto-diagnostic system ensures even more rapid reaching of set humidity and very short recovery times while avoiding condensate formation; humidity supply with distilled water (from an external tank) by a self-priming pump; integral bacteria block by generating hotsteam, dehumidifying via sterile filter.			□	□	□
Monitor	Microprocessor temperature monitor acting as overtemperature protection, with Pt100 incorporating fault diagnostics with visual and audible alarm			□	□	□
	Digital over- and undertemperature monitor			□	□	□
	Temperature monitoring band automatically linked to the setpoint (ASF)			□	□	□
	Relay for reliable heating cut-off in case of fault			□	□	□
	Mechanical temperature limiter (TB)			□	□	□
	Audible alarm: Over- and undertemperature, over-/underhumidity, open door and empty water tank			□	□	□
Timer functions	Real-time/weekly programmer with group function (e.g. Monday-Friday), programme operation with up to 40 ramps for temperature and humidity (MEMoryCard XL)			□	□	□

Subject to technical modifications
All performance data are typical average values for standard appliances

1) Less 25 mm for air duct in the middle of the back wall
2) Variable through adjustable feet
3) Without door handle, depth of handle 38 mm
4) Operating range from 8 °C above ambient

□ Standard model, basic specification

Model sizes		HCP	108	153	246
Documentation	Internal log memory 1024 kB as ring memory for all setpoints, actual values, errors, settings with real-time and date; capacity approx. 3 months at 1 min intervals.		☐	☐	☐
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)		☐	☐	☐
	"Celsius"[1] software for control and documentation of temperature and relative humidity.		☐	☐	☐
Setup	Calibration (no separate PC required), Temperature: 3-point calibration on controller, Humidity: 2-point calibration at 20% and 90%		☐	☐	☐
	Setting of language for dialogue and display D / UK / E / F / I		☐	☐	☐
Further data	Electrical supply 230 V[2] (± 10%), 50/60 Hz	V	230	230	230
	Electrical load	approx. W	1000	1500	2000
	Net weight / Gross weight	approx. kg	70 / 78	82 / 114	110 / 160
Standard accessories	Perforated stainless steel shelves (grids to order)	number	2 ☐	2 ☐	2 ☐
	Shelf or grid width	approx. mm	556	480	640
	Shelf or grid depth	approx. mm	361	400	500
	Works calibration certificate (test point chamber centre at 60 °C)		☐	☐	☐
Standard version	Humidity Chamber HCP		HCP 108	HCP 153	HCP 246
Options	Entry port[3] in the rear heated, can be closed by silicone stopper, diam. 57 mm		F9	F9	F9
	Additional Pt100 temperature sensor, positioned flexibly in chamber or load, for local temperature measurement (up to 3 additional sensors are possible). The measured temperature can, if required, be indicated on the multifunction display, recorded in the integral ring store, and can be documented via the "Celsius"[3] software or on an attached printer. During programme operation the additional temperatures of the flexible sensors can, if required, also be employed for the function "setpoint-dependent start of a hold ramp" SPWT (setpoint wait). The subsequent ramp starts only when all the installed sensors have reached the set temperature of the next ramp.		H8(x)	H8(x)	H8(x)
	Additional perforated stainless steel shelf		E7(x)	E7(x)	E7(x)
	Additional stainless steel grid		E3(x)	E3(x)	E3(x)
	Moisture-tight entry port[3] (standard position centre/centre or centre top) for introducing connections at the side, can be closed from inside by silicone stopper, 23 mm clear diameter (please state location or order no. when ordering)	left centre/centre left centre top right centre/centre right centre top	F0 F1 F2 F3	F0 F1 F2 F3	F0 F1 F2 F3
	Stacking version for 2 units of equal size (bottom unit modification)		G3	G3	G3
	Subframe (622 mm high)[4]		G5	G5	G5
	Subframe (130 mm high for 2 stacked cabinets)[4]		G7	G7	G7
	Temperature profile write/read unit for programming via PC, for writing to and reading from the chip card, up to 40 ramps		V3	V3	V3
	Additional chip card, blank, formatted (32 kB MEMoryCard XL for a maximum of 40 ramps)		V4	V4	V4
	STERICard (additional or as replacement) for automatic chamber sterilisation cycle (not for sterilising the load!)		V9	V9	V9
	Oven-linked authorisation card (User-ID-Card) prevents undesired manipulation by unauthorised third parties. When reordering please specify serial number		V1	V1	V1
	Computer interface RS485 (for networking a maximum of 16 ovens) instead of USB		V2	V2	V2
	RS232 interface instead of USB		W6	W6	W6
	Interface Ethernet instead of USB incl. software "Celsius Ethernet-Edition"		W4	W4	W4
	Parallel/USB converter cable with integrated power supply unit to connect HP printers with USB interface to MEMMERT units		W1	W1	W1
	Documentation package consisting of parallel USB converter cable including PCL3-compatible HP colour inkjet printer with USB interface (HP Deskjet 6980 or successor) for direct connection of printer to Memmert unit		W2	W2	W2
	USB connection cable for computer interface		W7	W7	W7
	Connection cable for computer interface RS232 according to DIN 12 900-1		V6	V6	V6
	Process-dependent electromagnetic door lock[3]		D4	D4	D4
	Potential-free contact (24 V/2 A) with socket to NAMUR NE 28 for external monitoring (setpoint of temperature and rh is reached)		H5	H5	H5
	ditto, for combination error message of temperature and rh controller (e. g. supply failure, sensor fault or fuse)		H6	H6	H6
	Works calibration certificate for 80% rh (measured at 50 °C)		Z5	Z5	Z5
	IQ check list with works test data for humidity chamber as support for validation by customer		Q1	Q1	Q1
	OQ check list with works test data for one[5] free-selectable temperature and humidity value incl. distribution survey for 27 measuring points to DIN 12880: 2007-05 as support for validation by customer		Q2	Q2	Q2
	Software conforming to FDA „Celsius FDA Edition"[6] for up to 16 units. Meets the requirements for the use of electronically stored data sets and electronic signatures as laid down in Regulation 21 CFR Part 11 of the US Food and Drug Administration (FDA) – description see page 9		Q3	Q3	Q3
	Integration of additional units (up to max.16 units) into an already existent FDA-software licence[6]		Q4	Q4	Q4
	Guarantee extension by 1 year		Q5	Q5	Q5
	Start-up of HCP and brief training[7] (D, A, CH only) through MEMMERT service. Requirement: humidity chamber is at its final location and all services have been provided by the purchaser. (Applies only in connection with orders and payments for new units)		K9	K9	K9

Subject to technical modifications
All performance data are typical average values for standard appliances

1) MEMMERT "Celsius" software has been tested for Windows 7, Vista and XP
2) Option 115 V, 50/60 Hz
3) Special equipment requires 20% payment in advance of apparatus price
4) Screws for adjusting height are taken out of the feet and mounted into the subframe
5) Further temperature distribution surveys as option
6) Requires Windows 2000 Professional or XP Professional
7) Service not subject to any discount
☐ Standard model, basic specification
(x) Please specify quantity required after the order number

Universal ovens
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Hot air sterilisers
Ovens

Vacuum ovens

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Some of the illustrations in this publication include special accessories. We reserve the right of technical modifications. Dimensions are subject to confirmation.

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